

REMARKS.

The present response is submitted in reply to the non-Final Office action issued on October 10, 2006. Claims 1-11 are pending in this application. As set forth in the Office action, claims 1, 2 and 5-11 have been rejected and claims 3 and 4 have been objected to but are deemed to contain allowable subject matter. The Applicant wishes to thank the Examiner for the conclusion that claims 3 and 4 include allowable subject matter. By the present response, claims 1, 2 and 4-11 have been amended and claim 3 has been canceled. It is noted that the features of claim 3 have been incorporated into independent claim 1. In addition, the claims have been amended to recite an apparatus for generating sinusoidal pressure waves for application to a *drill string* rather than to a *mandrel*. Support for this amendment may be found throughout the specification, such as in paragraphs [0039], [0046] and [0047]. Additional informal amendments have been made to the claims for clarification purposes. No new matter has been added. Reconsideration is respectfully requested in light of the amendments being made hereby and of the following remarks.

Information Disclosure Statement

The Examiner notes that the references cited in the Search Report by the Australian Patent Office have been considered but will not be listed on any resulting patent. In addition, the Examiner notes that the listing of references in the specification is not a proper information disclosure statement and therefore those references have not been considered. Enclosed herewith is an Information Disclosure Statement to make the above-noted prior art references of record in the present application.

Rejection of claims 1-2 and 5-11 under 35 U.S.C. 103(a)

Claims 1, 2 and 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,806,608 (DuBois) in view of U.S. Patent No. 6,378,951 (Bouyoucos, et al.). Claims 1, 2 and 5-11 are also rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,209,564 (Manci) in view of Bouyoucos, et al. Claims 1, 2 and 5-11 are further rejected under 35 U.S.C. 103(a) as being unpatentable over DuBois in view of U.S. Patent No. 5,549,170 (Barrow). Lastly, claims 1, 2 and 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manci in view of Barrow.

According to the Examiner, DuBois and Manci, respectively, teach every limitation of claims 1, 2 and 5-11 except for a piston shaft connected to the work piston and adapted to transmit the forces generated by the reciprocating motion of the piston to a mandrel, nor do they disclose that a rig supports the cylinder and the work piston includes a piston shaft which is connectable to the mandrel. Lastly, the Examiner states that neither DuBois or Manci discloses that the cylinder chamber forms part of a drill head that includes a ballast weight. In each instance, the Examiner respectively refers to Bouyoucos, et al. and Barrow for teaching the deficiencies of DuBois and Manci. The Examiner concludes that it would have been obvious to one of ordinary skill in the art to use the vibratory cylinder of DuBois/Manci in the rig of Bouyoucos, et al./Barrow and doing so would have been simple and lightweight and would allow the use of air instead of hydraulic power. The Examiner further notes that Barrow discloses that multiple sonic devices may be used to eliminate cuttings.

The Applicants respectfully submit that to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or

motivation to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The Applicants respectfully submit that one skilled in the art would have no suggestion or motivation to combine the aforementioned references in order to arrive at the present invention. Additionally, even if one skilled in the art were to consider the combinations of prior art teachings, each and every limitation of the present invention would not be disclosed.

The Applicants respectfully submit that claim 1, as noted above, has been amended to include the allowable subject matter of dependent claim 3, namely, a relief bore communicating with the bore of the chamber and having a first end open to the bore of the chamber above the first land of the work piston and a second end open to the bore of the chamber below the second land of the work piston, and where the relief bore includes a reciprocable relief piston, the movement of which is determined by the movement of fluid into and out of the relief bore from the bore of the chamber. In light of this amendment, it is respectfully submitted that the combination of cited prior art does not teach each and every limitation of independent claim 1. Withdrawal of each of these obviousness rejections is respectfully requested.

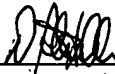
Conclusion

In light of the foregoing claim amendments and arguments, it is believed that the present application is in condition for allowance, and such action is earnestly solicited. The Examiner is invited to call the undersigned if there are any remaining issues to be discussed which could expedite the prosecution of the present application.

Respectfully submitted,

Date: January 29, 2007

D. Peter Hochberg Co., L.P.A.
1940 E. 6th St. - 6th Floor
Cleveland, OH 44114
(216) 771-3800
DPH/SM

By: 
D. Peter Hochberg
Reg. No. 24,603